

Fig 1.
Versions and States within a single database

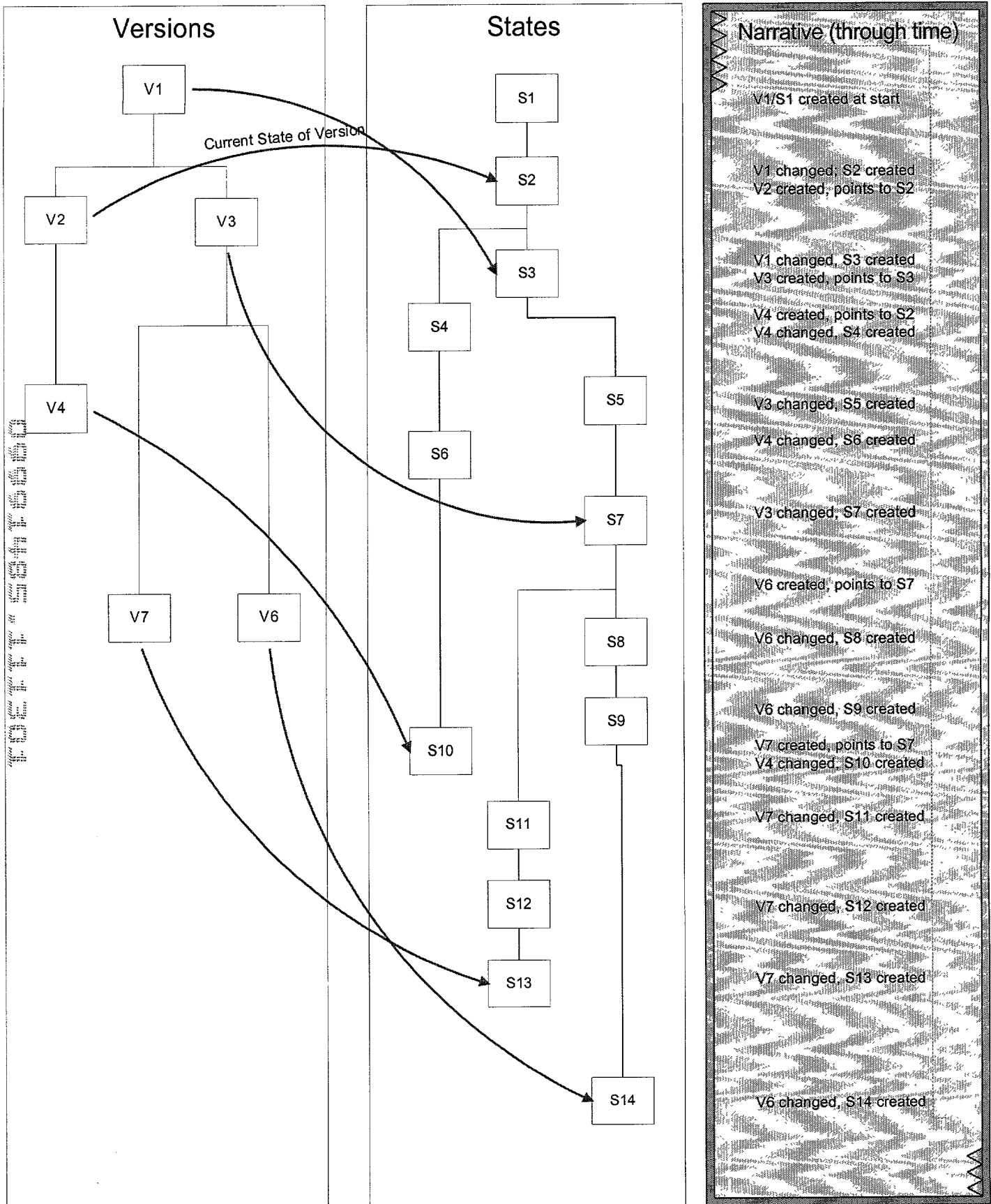


Figure 2

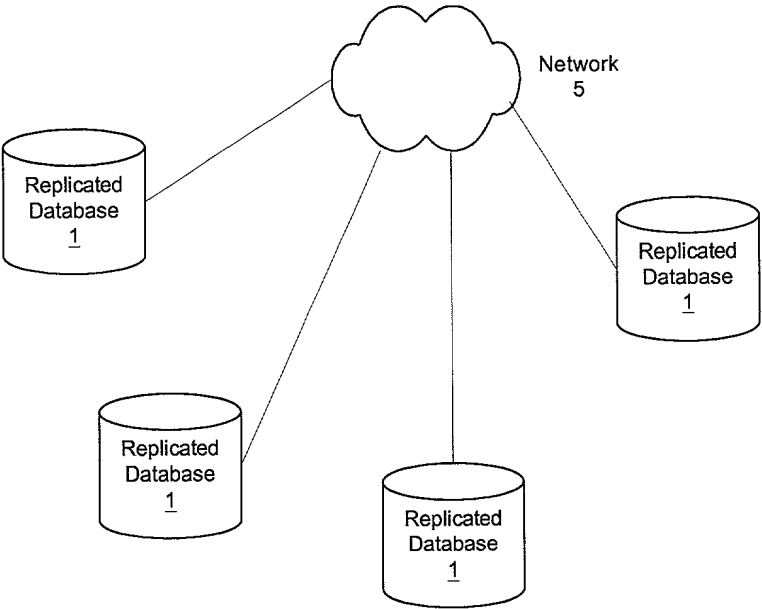


Figure 3

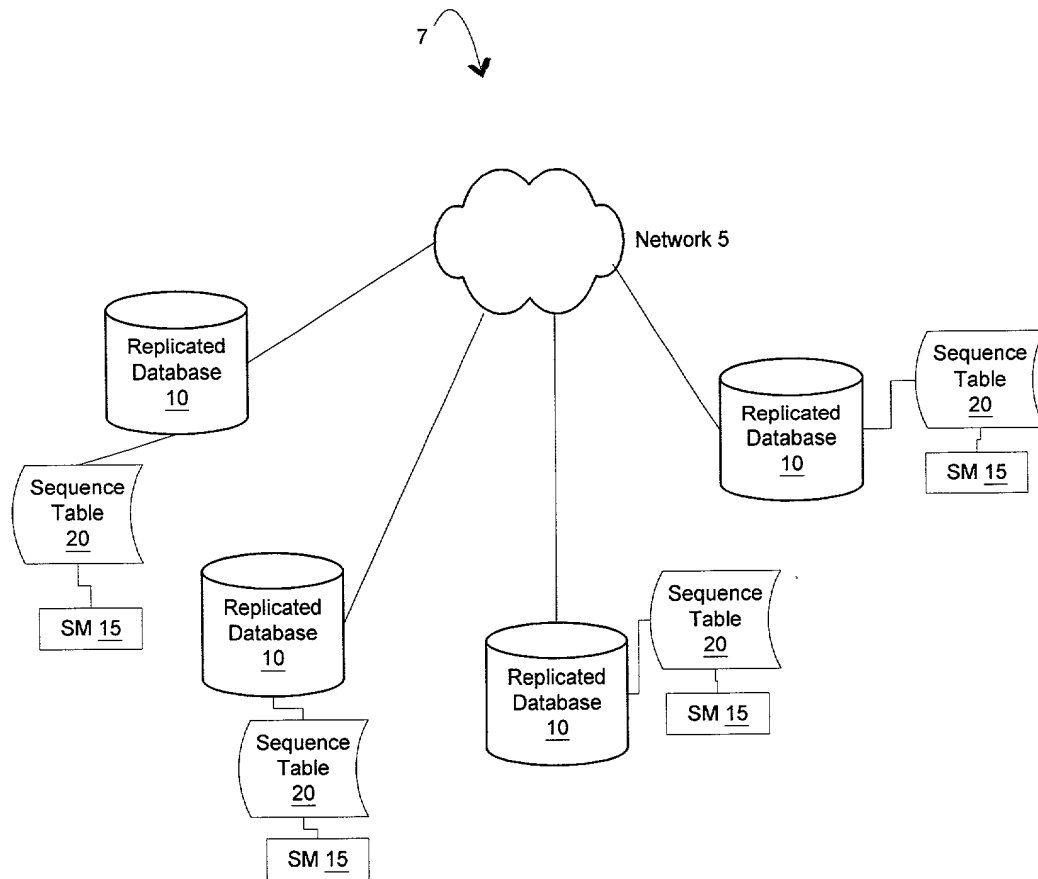


Fig. 4

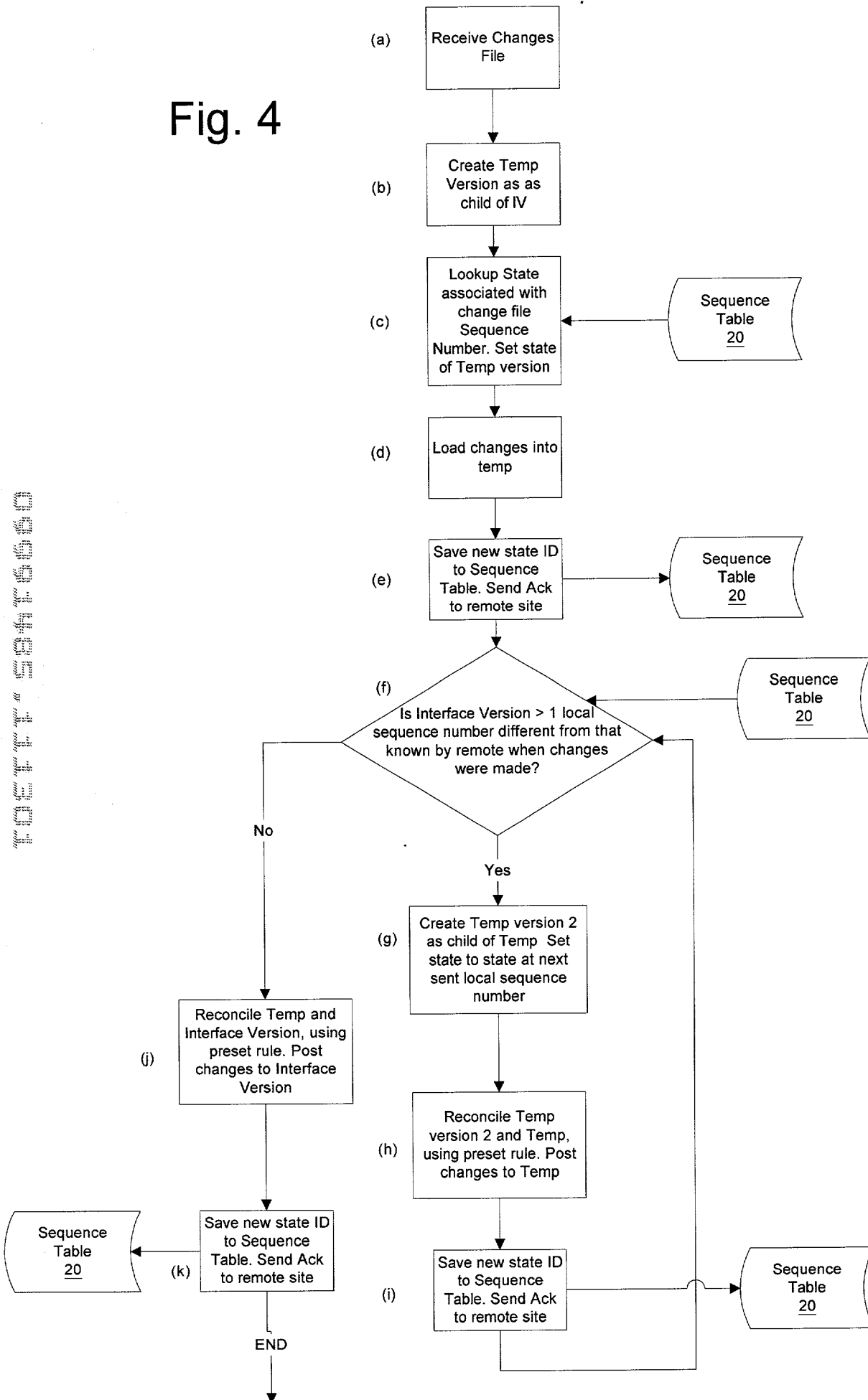


Fig. 5a

Number	Event	Local seq table	Versions & State(s)	Local Seq	Remote Seq	Versions & State(s)	Remote Seq Table	Local In Q	Remote In Q
100	Start	A,M,51,34	LIV-51	A	M	RIV-34	M,A,34,51		
105	Remote makes changes, saves state 35. Sends changes marked N,A,35, updates seq table.	A,M,51,34	LIV-51	B	N	RIV-35	M,A,34,51 N,A,35,?	C/N,A,35	
110	Local makes changes, saves state 61. Sends changes marked B,M,61, updates seq table	A,M,51,34 B,M,61,?	LIV-61	B	N	RIV-35	M,A,34,51 N,A,35,?	C/N,A,101	C/B,M,61
115	Local receives change file A,N,35. Creates Temp with state 51 (by looking up AM in seq table) and imports, creating state 65. Sends Ack A,N,65, updates seq table	A,M,51,34 B,M,61,? A,N,65,35	LIV-61 Temp-65	B	N	RIV-35	M,A,34,51 N,A,35,?		C/B,M,61 A/A,N,65
120									
125	Local reconciles Temp with LIV, resolving any conflicts using standing rules. Creates state 66, corresponding to B,N.	A,M,51,34 B,M,61,? A,N,65,35	LIV-61 Temp-66	B	N	RIV-35	M,A,34,51 N,A,35,?		C/B,M,61 A/A,N,65
130	Local Posts to LIV. Sends Ack B,N,66, updates seq table. If there were conflicts, then parks versions pointing to states 61 and 65, to allow replay of reconcile by human agent.	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	N	RIV-35	M,A,34,51 N,A,35,?		C/B,M,61 A/A,N,65 A/B,N,66
135	Remote makes changes, saves state 36. Sends changes marked O,A,36, updates seq table	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-36	M,A,34,51 N,A,35,? O,A,36,?	C/O,A,36	C/B,M,61 A/A,N,65 A/B,N,66
140	Remote receives B,M,61.	A,M,51,34	LIV-66	B	O	RIV-36	M,A,34,51	C/O,A,36	A/A,N,65

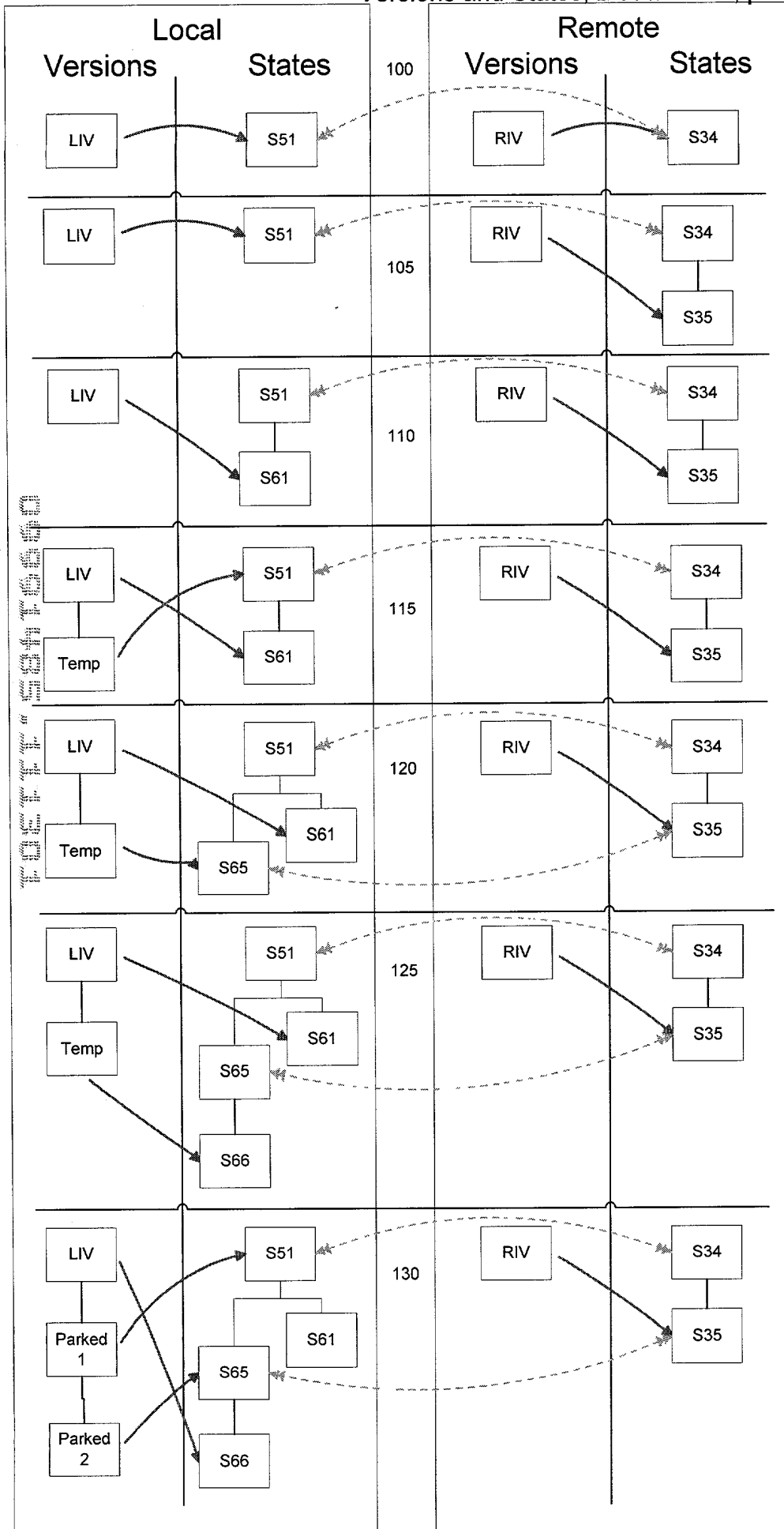
Fig. 5b

145	Creates temp at state 34 (by looking up AM in seq table) and imports, creating state 40. Sends Ack M,B,40, updates seq table	B,M,61,? A,N,65,35 B,N,66,?	Parked-61 Parked-65			Temp-40	N,A,35,? O,A,36,? M,B,40,61	A/M,B,40	A/B,N,66
150	Too many steps between M and O to reconcile directly. Remote creates Temp2, sets to state 35 (local sequence N)	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-36 Temp-40 Temp2-35	M,A,34,51 N,A,35,? O,A,36,? M,B,40,61	C/O,A,36 A/M,B,40	A/A,N,65 A/B,N,66
155	Remote Reconciles Temp with Temp2, applying conflict rules, creating new state 41	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-36 Temp-40 Temp2-41	M,A,34,51 N,A,35,? O,A,36,? M,B,40,61	C/O,A,36 A/M,B,40	A/A,N,65 A/B,N,66
160	Remote Posts to Temp, sends Ack N,B,41, updates seq table. Deletes Temp2 if no conflicts during reconcile	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-36 Temp-41	M,A,34,51 N,A,35,? O,A,36,? M,B,40,61 N,B,41,?	C/O,A,36 A/M,B,40 A/N,B,41	A/A,N,65 A/B,N,66
165	RIV now references AO, Temp references BN. Only one step on either side, so allowed to reconcile. Remote reconciles Temp with RIV, creating state 42.	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-36 Temp-42	M,A,34,51 N,A,35,? O,A,36,? M,B,40,61 N,B,41,?	C/O,A,36 A/M,B,40 A/N,B,41	A/A,N,65 A/B,N,66
	Remote Posts to RIV, sends Ack O,B,42, updates seq table. Deletes Temp if no conflicts during reconcile	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-42	M,A,34,51 N,A,35,? O,A,36,? M,B,40,61 N,B,41,? O,B,42,?	C/O,A,36 A/M,B,40 A/N,B,41 A/O,B,42	A/A,N,65 A/B,N,66
	Remote Receives Acks AN65, and BN66. updates seq table	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,?	LIV-66 Parked-61 Parked-65	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,? M,B,40,61 N,B,41,66 O,B,42,?	C/O,A,36 A/M,B,40 A/N,B,41 A/O,B,42	

Fig. 5c

Local receives change file A,O,36. Creates Temp with state 65 (by looking up AN in seq table) and imports, creating state 70. Sends Ack A,O,70, updates seq table	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,? A,O,70,36	LIV-66 Parked-61 Parked-65 Temp-70	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,? M,B,40,61 N,B,41,66 O,B,42,?	A/M,B,40 A/N,B,41 A/O,B,42	A/A,O,70
Local reconciles Temp with LIV, resolving any conflicts using standing rules. Creates state 71, corresponding to B,O.	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,? A,O,70,36	LIV-66 Parked-61 Parked-65 Temp-71	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,? M,B,40,61 N,B,41,66 O,B,42,?	A/M,B,40 A/N,B,41 A/O,B,42	A/A,O,70
Local Posts to LIV. Sends Ack B,O,71, updates seq table. Deletes Temp if no conflicts	A,M,51,34 B,M,61,? A,N,65,35 B,N,66,? A,O,70,36 B,O,71,?	LIV-71 Parked-61 Parked-65	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,? M,B,40,61 N,B,41,66 O,B,42,?	A/M,B,40 A/N,B,41 A/O,B,42	A/A,O,70 A/B,O,71
Local receives Ack files MB40, NB41, OB42. updates seq table	A,M,51,34 B,M,61,40 A,N,65,35 B,N,66,41 A,O,70,36 B,O,71,42	LIV-71 Parked-61 Parked-65	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,? M,B,40,61 N,B,41,66 O,B,42,?	A/M,B,40 A/N,B,41 A/O,B,42	A/A,O,70 A/B,O,71
Remote receives Ack files AO70, BO71. updates seq table	A,M,51,34 B,M,61,40 A,N,65,35 B,N,66,41 A,O,70,36 B,O,71,42	LIV-71 Parked-61 Parked-65	B	O	RIV-42	M,A,34,51 N,A,35,65 O,A,36,70 M,B,40,61 N,B,41,66 O,B,42,71		

Fig. 6a -
Versions and States, 2 databases, part 1



Narrative (through time)

Systems start in synch.
Only looking at relevant versions
Note version and state names in the two databases are unrelated.
States S51 and S34 contain identical data.

RIV updated, S35 created.
No change in local db
Remote sends change file containing differences between S34 and S35

LIV updated, S61 created
Change file from remote not yet received.
Local db sends change file to remote containing differences between S51 and S61
No more changes at remote

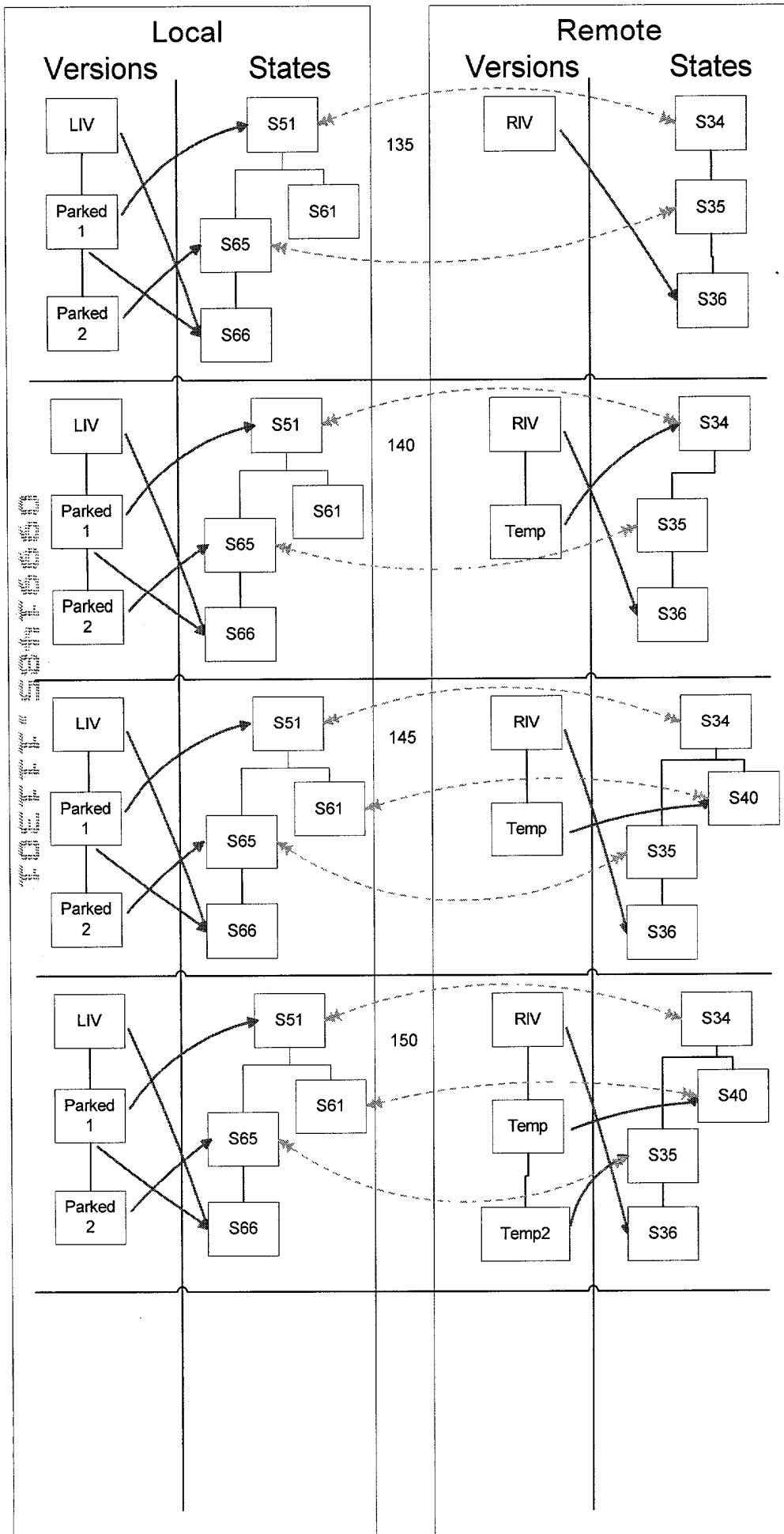
Local receives change file.
Creates Temp version to load file into. Sets Temp state to local state identical to that representing start point of incoming changes (S51).

Change file loaded into Temp, creating new state S65.

Temp reconciled with LIV.
Differences from S51 to S61 copied onto S65, creating new state S66. Any conflicts resolved according to preset rules (local wins or remote wins)

Changes posted from Temp to LIV. LIV changes state to S66
Change file not sent to remote, because it already has all the data required to reconstruct.

Fig. 6b
Versions and States, 2 databases, part 2



Narrative (through time)

Systems start as at end of Part 1

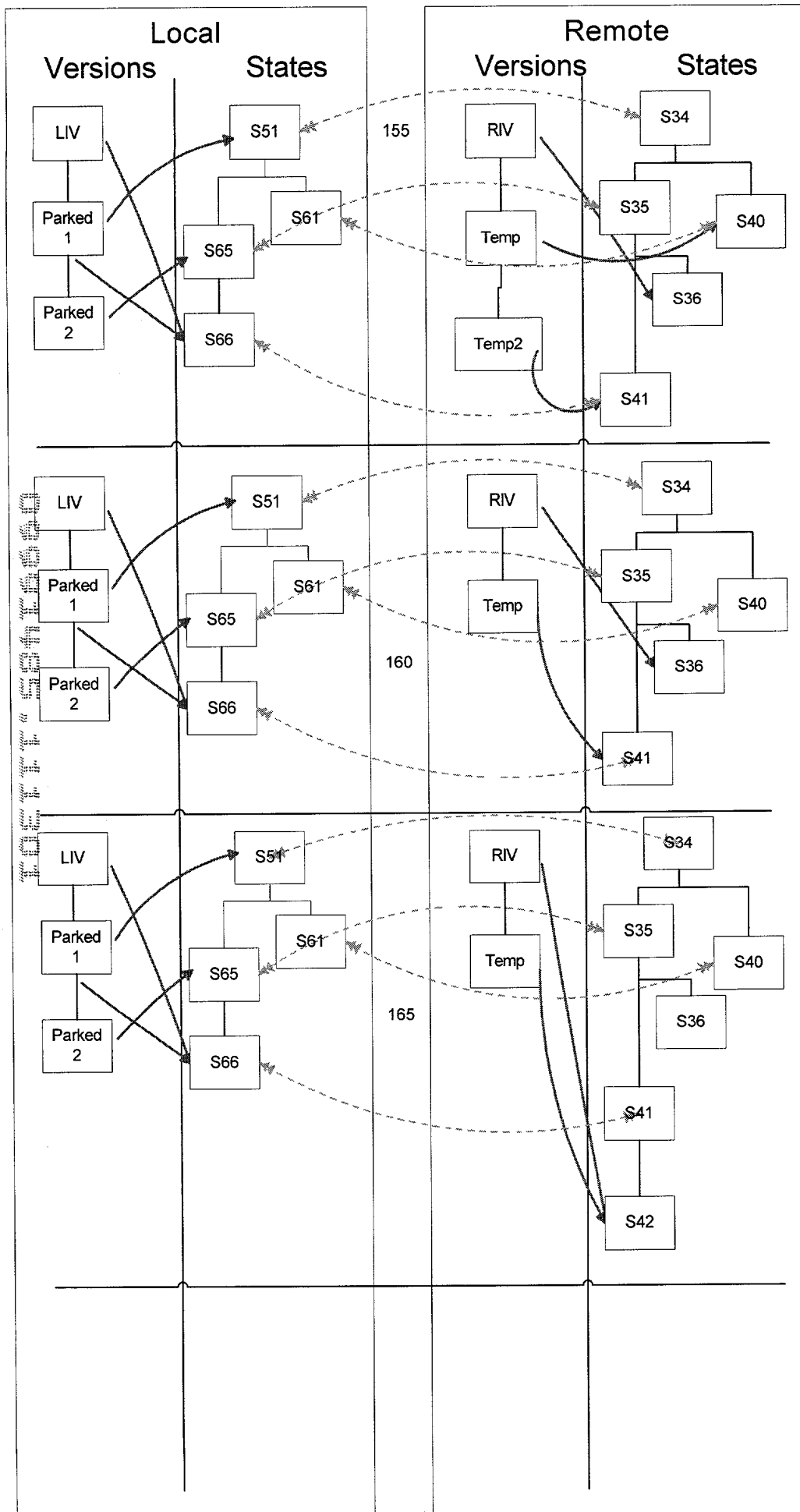
RIV updated, creates S36

Remote db receives Change file 1
containing S51 to S61
Creates Temp version, sets
to S34 (identical to S51).

Change file loaded to Temp,
creating new state S40
S40 is identical to Host S61

From sequence tables,
Temp cannot be reconciled
against S36, because there
are too many steps.
New version Temp2 created
and set to state S35

Fig. 6c
Versions and States, 2 databases, part 3



Narrative (through time)

Systems start as at end of Part 2

Temp2 reconciled with Temp, creating new state S41. Any conflicts resolved using same rules as for local db (in the sense of local wins or remote wins) New state S41 is now identical with local state S66

Temp2 posts changes to Temp. Temp now points to S41

Consulting Sequence tables again, it is allowed to reconcile RIV to Temp.

Temp then posts to RIV

RIV now contains all local changes and changes from Local db

Local db loads second remote db change file, reconciles, posts.... Now identical set of states as remote db.